

WHAT IS CLAIMED IS:

1. A method for modeling a structure deployed on a spacecraft comprising:

selecting a representative geometric shape which resembles a deployed structure; and

generating time-varying mass properties of said geometric shape as a function of a physical parameter of said deployed structure that describes the degree of the deployment as one body.

2. The method of Claim 1, wherein said deployed structure comprises a flexible large reflector.

3. The method of Claim 2, wherein said flexible large reflector comprises an L-band antenna.

4. The method of Claim 1, wherein said geometric shape is taken from the group consisting of spherical, cylindrical and elliptical shapes.

5. The method of Claim 1, wherein said generating comprises calculating the rotational and translation variation of a center of mass of said deployed structure as one body.

6. The method of Claim 1, wherein said physical parameter of said deployed structure comprises at least one mechanical member having a variable length.

7. The method of Claim 1, wherein said physical parameter of said deployed structure comprises at least one mechanical member which has a variable orientation relative to other mechanical members of said deployed structure.

8. A method for modeling a structure deployed on a spacecraft comprising:

determining a geometric shape that resembles the structure in a fully deployed configuration;

generating time functions for a change in shape of at least one structural component of said structure, said change in shape occurring as said structure expands into said fully deployed configuration; and

calculating mass properties of said geometric shape as a function of said time functions.

9. The method of Claim 8, wherein said structure comprises an antenna structure.

10. The method of Claim 9, wherein said antenna structure comprises an L-band antenna.

11. The method of Claim 8, wherein said geometric shape comprises an elliptical cylindrical shell.

12. The method of Claim 8, wherein said geometric shape is taken from the group consisting of spherical, cylindrical and elliptical shapes.

13. The method of Claim 8, wherein said calculating comprises calculating the rotational and translation variation of a center of mass of said geometric shape.

14. The method of Claim 8, wherein said structural component comprises a plurality of truss members configured to support a mesh-like screen, wherein at least one of said truss members comprises a variable length and wherein at least one of said truss members

changes orientation relative to said other truss members.

15. A method for modeling a structure deployed on a spacecraft comprising:

generating time functions for a structural component located on a periphery of an antenna structure as said structural component varies from a first length to a second length and as said structural component varies between a first orientation and a second orientation; and

calculating mass properties of an elliptical cylindrical shell as a function of said time functions.

16. The method of Claim 15, wherein said antenna structure comprises an L-band antenna.

17. The method of Claim 15, wherein said calculating comprises calculating the rotational and translation variation of a center of mass of said elliptical cylindrical shell.

18. A method for modeling an expandable structure deployed on a spacecraft comprising:

determining a geometric shape that resembles the expandable structure in a fully expanded configuration;

generating time functions for a length of a structural component of said expandable structure, said length configured to vary as said expandable structure expands; and

calculating mass properties of said geometric shape as a function of said time functions for said length.

19. The method of Claim 18, wherein said expandable structure comprises an antenna structure.

20. The method of Claim 18, wherein said antenna structure comprises an L-band antenna.

21. The method of Claim 18, wherein said geometric shape comprises an elliptical cylindrical shell.

22. The method of Claim 18, wherein said geometric shape is taken from the group consisting of spherical, cylindrical and elliptical shapes.

23. The method of Claim 18, wherein said calculating comprises calculating the rotational and translation variation of a center of mass of said geometric shape.

24. The method of Claim 18, wherein said structural component comprises a plurality of truss members configured to support a mesh-like screen, wherein at least one of said truss members comprises a variable length and wherein at least one of said truss members changes orientation relative to said other truss members.